

REMARKS

Claims 1-21 are pending in this application. By this Amendment, claims 1, 11, 13 and 21 are amended. Reconsideration of the application is respectfully requested.

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; and (c) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

The Office Action rejects claims 1-3, 6-13 and 16-21 under 35 U.S.C. §102(b) over Yamamoto et al. (U.S. Patent No. 6,293,095); and claims 1-21 under 35 U.S.C. §102(e) over Sugiura et al. (U.S. Patent No. 6,220,019). The rejections are respectfully traversed.

In particular, none of the applied references, alone or in combination, disclose or suggest a method of controlling an internal combustion engine, and associated control system, that includes controlling burning of fuel to operate the internal combustion engine, and injecting fuel into the internal combustion engine during a moving state of the engine while leaving substantially all the fuel unburned, before a normal operation of the engine by fuel being burned, as recited in independent claim 1 and similarly recited in independent claims 11 and 21. Support for this feature can be found in the specification at, for example, paragraph [0025].

Yamamoto teaches an in-cylinder injection type internal combustion engine that includes a main fuel injection control unit that drives a fuel injector to inject fuel directly into a combustion chamber so that premixed combustion or stratified charge combustion takes place depending upon operating conditions of the engine (Abstract). The Office Action

indicates that Yamamoto teaches unburned hydrocarbons remaining in the exhaust chamber 10A (Office Action, page 6, lines 17-19). A close examination of Yamamoto indicates that Yamamoto clearly teaches that the air and fuel mixture is ignited by a spark produced by the spark plug 7 to start burning and generating engine torque and resulting exhaust gas is then discharged (col. 6, lines 62-66). Accordingly, the air and fuel mixture is ignited before the engine torque is generated, thus before a normal operation of the engine. Moreover, the air and fuel mixture is not ignited during a moving state of the engine and before the engine torque is generated. Accordingly, Yamamoto does not disclose or suggest injecting fuel into the engine and leaving substantially all the fuel unburned, before a normal operation of the engine, as recited in the independent claims, because Yamamoto teaches igniting the fuel before a normal operation of the engine and not during a moving state of the engine. The Patent Office indicates that part of the additional fuel injected during the expansion stroke is still burning without being extinguished, and the unburned hydrocarbons remaining in the exhaust chamber are mixed with the exhaust gas that is still burning. However, Yamamoto does not teach that fuel is injected without being burned during a moving state of the engine and before a normal operation of the engine because Yamamoto clearly teaches that the fuel is burned before generating engine torque. Thus, Yamamoto fails to disclose or suggest each and every feature of independent claims 1, 11 and 21.

Sugiura teaches a system and method that judges whether the lean operation in which the air-fuel ratio is set to be on the lean side with respect to the theoretical air-fuel ratio is currently performed or not if conditions of stopping an engine are satisfied (Abstract). In other words, Sugiura teaches a set of conditions under which the engine must be stopped (col. 6, line 59 - col. 7 - line 63). However, Sugiura fails to teach that before a normal operation of the engine, fuel is injected into the engine while leaving substantially all the fuel unburned, as recited in the independent claims. The focus of Sugiura appears to be, as

indicated in Figs. 4-6, to determine what conditions are satisfied to stop the engine. For example, step S11, which determines an engine stop judgment, is a step during which an engine stop judging process is executed to determine whether the operation conditions in which the engine should be stopped are satisfied or not, and if these conditions are satisfied, then a stop judgment flag FESTP is set to a value of "1" and the engine is stopped by interrupting the fuel supply to the engine and the supply of the driving signal to the ignition plugs. However, Sugiura does not disclose or suggest that before a normal operation of the engine, fuel is injected into the engine during a moving state of the engine while leaving substantially all the fuel unburned, as recited in the independent claims. Thus, Sugiura fails to disclose or suggest the features of independent claims 1, 11 and 21.

For at least these reasons, independent claims 1, 11 and 21, and their dependent claims, are patentable over the applied references. Thus, withdrawal of the rejections of the claims under 35 U.S.C. §102(b) and 35 U.S.C. §102(e) is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-21 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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